

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

The International Bureau of WIPO
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NOTIFICATION CONCERNING
DOCUMENTS TRANSMITTED

Date of mailing
(day/month/year)

11.01.2007

International application No: PCT/GB2005/050223

This International Preliminary Examining Authority transmits herewith the following documents:

1. ☐ demand (Rule 61.1(a)).
2. ☒ copy of the international preliminary examination report and its annexes (Rule 71.1).
3. ☐ _____ other documents (*specify*):

Name and mailing address of the international
preliminary examining authority:



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference XA1952		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/GB2005/050223		International filing date (day/month/year) 01.12.2005		Priority date (day/month/year) 03.12.2004
International Patent Classification (IPC) or national classification and IPC INV. G01S5/06 G01S5/02				
Applicant BAE SYSTEMS PLC et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 19.09.2006		Date of completion of this report 11.01.2007		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer LOPEZ DE VALLE, J Telephone No. +49 89 2399-5675		



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-10 as originally filed

Claims, Numbers

1-10 received on 19.09.2006 with letter of 13.09.2006

Drawings, Sheets

1/4-4/4 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-6
	No: Claims	7-10
Inventive step (IS)	Yes: Claims	
	No: Claims	7-10
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

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Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: JUNHO CHOI ET AL: "Localization of target tracking and navigation by correcting atmospheric effects" IGARSS 2001. IEEE 2001 INTERNATIONAL GEOSCIENCE AND REMOTE SENSING SYMPOSIUM. SYDNEY, AUSTRALIA, JULY 9 - 13, 2001, IEEE INTERNATIONAL GEOSCIENCE AND REMOTE SENSING SYMPOSIUM, NEW YORK, NY : IEEE, US, vol. VOL. 1 OF 7, 9 July 2001, pages 1711-1713, XP010572231 ISBN: 0-7803-7031-7

2. Although claims 8 ('A *computer program*') and 9 ('A *computer program product*') have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter as the term *computer program* and the term *computer program product* are synonymous terms. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

Moreover, since claim 9 contains all the features of claim 8, claim 9 must be dependent on claim 8.

3. The subject-matter of claims 1-6 is neither known from, nor rendered obvious by, the available prior art, meeting the requirements of the PCT with respect to novelty and inventive step. The reasons are as follows:

- 3.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A method for locating an emitter of electromagnetic waves utilising a plurality of receivers (p.1711, c.2, l.30-41), the method comprising the steps of:

- detecting the time of arrival of electromagnetic waves at said receivers;
- computing (p.1711, c.2, l.38-41) the relative time differences of arrival between said receivers using said detected times of arrival

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- estimating (p.1711, c.2, l.42-p.1712, c.1) the position of the emitter from said computed relative time difference of arrival and
 - correcting (p.1711, c.1, l.28 - p.1711, c.2, l.26) said detected times of arrival for path length discrepancies caused by the Earth's atmosphere.
- measuring (implicit, p.1711, c.2, l.38-41) time difference of arrival between pairs of said receivers;

The subject-matter of claim 1 differs from this known D1 in method steps for the correction, since D1 shows how the error corrections can be achieved by means of radio wave ray bending compensation through the refractivity profiles or ray tracing computed through the real time weather data, but not computed through the emitter received signals as claimed in claim 1. The subject-matter of claim 1 is therefore considered to be new (Article 33(2) PCT).

The solution to the problem proposed in claim 1 of the present application, which is namely to correct the detected position of the emitter, constitutes a simplification of the solution disclosed in D1, since the use of real-time weather data for calculating the corrections is not necessary. Thus, the subject-matter of claim 1 is considered as involving an inventive step (Article 33(3) PCT).

- 3.2 Claims 2-6 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
4. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 7-10 is not new in the sense of Article 33(2) PCT.
- 4.1 D1 discloses all the features of claim 7 as follows:
Apparatus for carrying out the method according to any one of the preceding claims, the apparatus comprising:
- a plurality of receivers, each receiver including means for detecting the time of arrival of electromagnetic waves received thereat;
 - means for computing (p.1711, c.2, l.38-41) the relative time difference of arrival between said receivers and for estimating (p.1711, c.2, l.42-p.1712, c.1) the

- position of said emitter; and
- means for correcting (p.1711, c.1, l.28 - p.1711, c.2, l.26) said detected times of arrival for path length discrepancies caused by the Earth's atmosphere.

Thus, the subject-matter of claim 7 is not new.

4.2 Notwithstanding the above-mentioned lack of clarity, the subject-matter of claims 8 and 9 lacks clarity. As they are claimed, said claims are interpreted as *'suitable for performing the method steps of any one of the claims 1 to 6'*. Since every computer program is suitable for that, the subject-matter of said claims is not new.

4.3 The same objection applies mutatis mutandis to the computer claim 10.

Re Item VIII

Certain observations on the international application

It is clear from the description (page 2, line 25- page 3, line 10; page 4, line 17-page 6, line 30) that the following features in new claim 1, which were included in the original filed claims 10 (basis for the new claim 1), are essential to the definition of the invention:

- (1) a known height (receiving platform height) is necessary to predict the actual path length
- (2) the assumed profile is a refractive profile

Since independent claim 1 does not contain these features it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.